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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,171	05/22/2000	Lawrence E. Myers	LWE-110	2275
30869	7590	04/08/2004	EXAMINER	
LUMEN INTELLECTUAL PROPERTY SERVICES, INC. 2345 YALE STREET, 2ND FLOOR PALO ALTO, CA 94306			MENEFE, JAMES A	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/576,171

Applicant(s)

MYERS ET AL.

Examiner

James A. Meneffee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-16, 19-28 and 32-36 is/are rejected.
- 7) ☒ Claim(s) 6-8, 17, 18 and 29-31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/9/2004 has been entered.

### ***Response to Amendment***

In response to the amendment filed 2/9/2004, claims 1, 9, 12-13, 19, and 22 are amended. Claims 1-36 are pending.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-4, 9-10, 22, 26-27, and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Keller et al. (previously cited US 5,237,577).

Regarding claim 1, see Fig. 3 of Keller. Keller discloses a saturable reflector apparatus comprising a substrate 51 comprising a modified surface (lower surface of the fig.) and a second surface (upper surface of the fig.), and a reflector 2,4 deposited on the second surface of the

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substrate, wherein said reflector includes a saturable absorber 4. The substrate is modified by etching and coating so that the modified surface and the reflector form two opposing surfaces of an etalon. The finesse of the etalon is not explicitly disclosed. However, this limitation was added to show that the etalon would be an actual etalon, and not an inadvertent etalon that was formed in the combination of the prior rejections; since the etalon of Keller is an actual etalon, the Examiner contends that the finesse will necessarily be greater than about 10.

Regarding claims 3-4, as noted above the modified surface includes a metallic coating 43.

Regarding claim 9, the reflector is a dielectric stack mirror, which is frequently called a Bragg reflector, thus the mirror with the saturable absorber is a saturable Bragg reflector.

Regarding claim 10, the reflector includes a metal or dielectric film.

Regarding claim 22, Keller discloses the saturable reflector as in the rejection of claim 1 above, and further discloses in Fig. 4 the saturable reflector an optical cavity with a lasing medium 103 and a pump 102.

Regarding claims 26-27 and 34-35, see rejection of claims 3-4 and 9-10 above.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keller.

Keller discloses the limitations of the claims as shown in the above § 102 rejection, but Keller

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does not disclose the modified surface as a polished surface. It is well known in the art that polishing is a method of making a reflective layer. It would have been obvious to one skilled in the art to use a polished surface rather than adding a metallic coating as the reflective layer, because polishing allows the mirror to be incorporated in the elements already in the system, eliminates the need of adding an additional layer to the system, as is well known.

Claims 5, 11-16, 19-21, 28, 32-33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keller in view of Weingarten et al. (previously cited US 6,393,035). Keller teaches the limitations of the claims shown above, but does not disclose the following:

Regarding claims 5, 16, and 28, Keller does not disclose that there are means for tuning the etalon effect. Weingarten teaches a saturable reflector having portions that are tuned (col. 5 lines 29-62). It would have been obvious to one skilled in the art to tune the material of the saturable reflector because this allows for an optimization of the modulation depth of the device, leading to the advantages given in lines 57-62, as taught by Weingarten. The Examiner maintains that such tuning will accomplish a tuning of the etalon effect.

Regarding claims 11, 32-33, and 36, Keller does not disclose the thickness of the substrate. Weingarten teaches a similar saturable reflector where the substrate is 400 microns, thus falling within the claimed range (col. 12 line 61). It would have been an obvious engineering design consideration to make the substrate this thick, because the thickness of the substrate does not appear to be critical to the operation of either Keller or Weingarten, and thus using the thickness shown in Weingarten will not significantly change the operation of Keller's

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device. Therefore the substrate has a thickness large enough to act like an etalon having a free spectral range of the same order as a linewidth of the laser, i.e. 1 GHz.

Regarding claim 12, this is a method claim that is a method of tuning a saturable reflector. The reflector is taught as in the rejection of claim 1 above. Keller does not disclose that the spectrum of radiation entering the etalon of the reflector may be modified. However, as shown in the rejection of claims 5 and 16, Weingarten teaches that the etalon effect may be tuned, thus modifying the spectrum of radiation through the etalon. Motivation is the same as that shown in the rejection of claims 5 and 16 above.

Regarding claims 13-15, Keller teaches these limitations as in the rejection of claims 2-4 above.

Regarding claims 19 and 21, it is not disclosed that the tuning will adjust the values as claimed. Examiner contends that should the device be tuned, as shown to be obvious in the above claim rejections, then the values as claimed will necessarily be adjusted.

Regarding claim 20, it is not disclosed that the tuning optimizes a relationship between temporal and frequency domains. It would have been obvious to one skilled in the art to tune the device such that this relationship is optimized, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keller in view of Kortz et al. (previously cited US 5,848,079). Keller discloses the limitations of claim 22 but does not disclose the laser cavity having a nonlinear crystal, specifically the type of crystal as

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claimed. Kortz teaches a laser cavity that includes a nonlinear crystal made of lithium borate (col. 4 lines 1-24). It would have been obvious to one skilled in the art to include such a nonlinear crystal in the laser cavity because it provides frequency multiplication, as taught by Kortz, thus a lower wavelength as required by a specific application may be attained.

***Allowable Subject Matter***

Claims 6-8, 17-18, and 29-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

There is not taught or disclosed in the prior art a saturable reflector including an etalon as claimed, including means for tuning the etalon effect by adjusting an optical thickness of the two opposing surfaces of the etalon, and more specifically the tuning is done using temperature tuning with a heat transfer element.

***Response to Arguments***

Applicant's arguments filed 2/9/2004 have been fully considered but are moot in light of the new rejections above.

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***Conclusion***

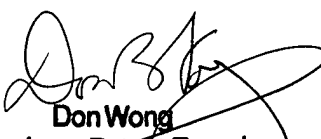
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JM  
March 29, 2004



Don Wong  
Supervisory Patent Examiner  
Technology Center 2800